

Notice of Allowability

Application No.

10/656,492

Examiner

Joshua A. Lohn

Applicant(s)

TANAKA ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Request for Continued Examination filed 9/14/06.
2. ☒ The allowed claim(s) is/are 1-20.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with George Yee on 9/26/2006.

The application has been amended as follows:

Please amend claims 10, 16, 17, and 20 to read as follows.

10. A disk array system comprising:

a disk controller; and

a disk array connected to the disk controller, said disk array being composed of a plurality of drive boards each mounting thereon a plurality of disk drives, and a common board on which the a plurality of drive boards being detachably mounted,

wherein said disk controller defines a part of the drive boards in the disk array as a first drive board group and the rest as a second drive board group, and manages a plurality of disk drives mounted on different drive boards in the first drive board group as a logical group,

wherein said disk controller recognizes drive boards belonging to said first disk drive board group as active drive boards and each drive board belonging to said second disk drive board group as a spare drive board,

the disk controller comprising:

means for reorganizing logical groups when failure occurs in any active disk drive belonging to the first drive board group, after storing the same data as that stored in disk drives on the faulty board on which a faulty drive is mounted into corresponding one of the disk drives on a substitution board selected from the second

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drive board group, so that each logical group to which one of disk drives on the faulty board belongs includes a new disk drive on the substitution board in place of the disk drive on the faulty board; and

means for informing a maintenance terminal that the faulty board is replaceable after the reorganization of the logical groups is completed.

16. The disk array system according to Claim 10, wherein:

said disk controller performs data read and data write in said disk array, and

said means for reorganizing logical groups adds said substitution board to the active drive boards and excludes said faulty board from the active drive boards after storing data into the disk drives on the substitution board

17. A failure recovering control method executed by a disk controller in a disk array system composed of the disk controller and a disk array connected to the disk controller, the disk array being composed of a plurality of drive boards each mounting thereon a plurality of disk drives, and a common board on which the plurality of drive boards being detachably mounted,

wherein said disk controller defines a part of the drive boards in the disk array as a first drive board group and the rest as a second drive board group, manages a plurality of disk drives mounted on different drive boards in said first drive board group as a logical group, wherein said disk controller recognizes drive boards belonging to said first disk drive board group as active drive boards and each drive board belonging to said second disk drive board group as a spare drive board,

the method comprising the steps of:

selecting a substitution board to be used in place of a faulty board on which a faulty drive is mounted from said second drive board group when failure occurs in any active disk drive belonging to said first drive board group;

storing the same data as that stored in each disk drive on the faulty board into disk drives on the substitution board;

reorganizing logical groups to each of which a disk drive on the faulty board belongs into new configuration including a new disk drives on the substitution board in place of the disk drive on the faulty board; and .

informing a maintenance terminal that the faulty board is replaceable after the logical groups are reorganized.

20. The failure recovering control method according to Claim 17, wherein:
said disk controller performs data read and data write in said disk array, adds said substitution board having been completed data storing to the active drive boards, and excludes said faulty board from the active drive boards through said reorganization of logical group performed when failure occurs in any active disk drive.

Allowable Subject Matter

Claims 1-20 are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua A. Lohn whose telephone number is (571) 272-3661. The examiner can normally be reached on M-F 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott Baderman can be reached on (571) 272-3644. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JAL



SCOTT BADERMAN
SUPERVISORY PATENT EXAMINER